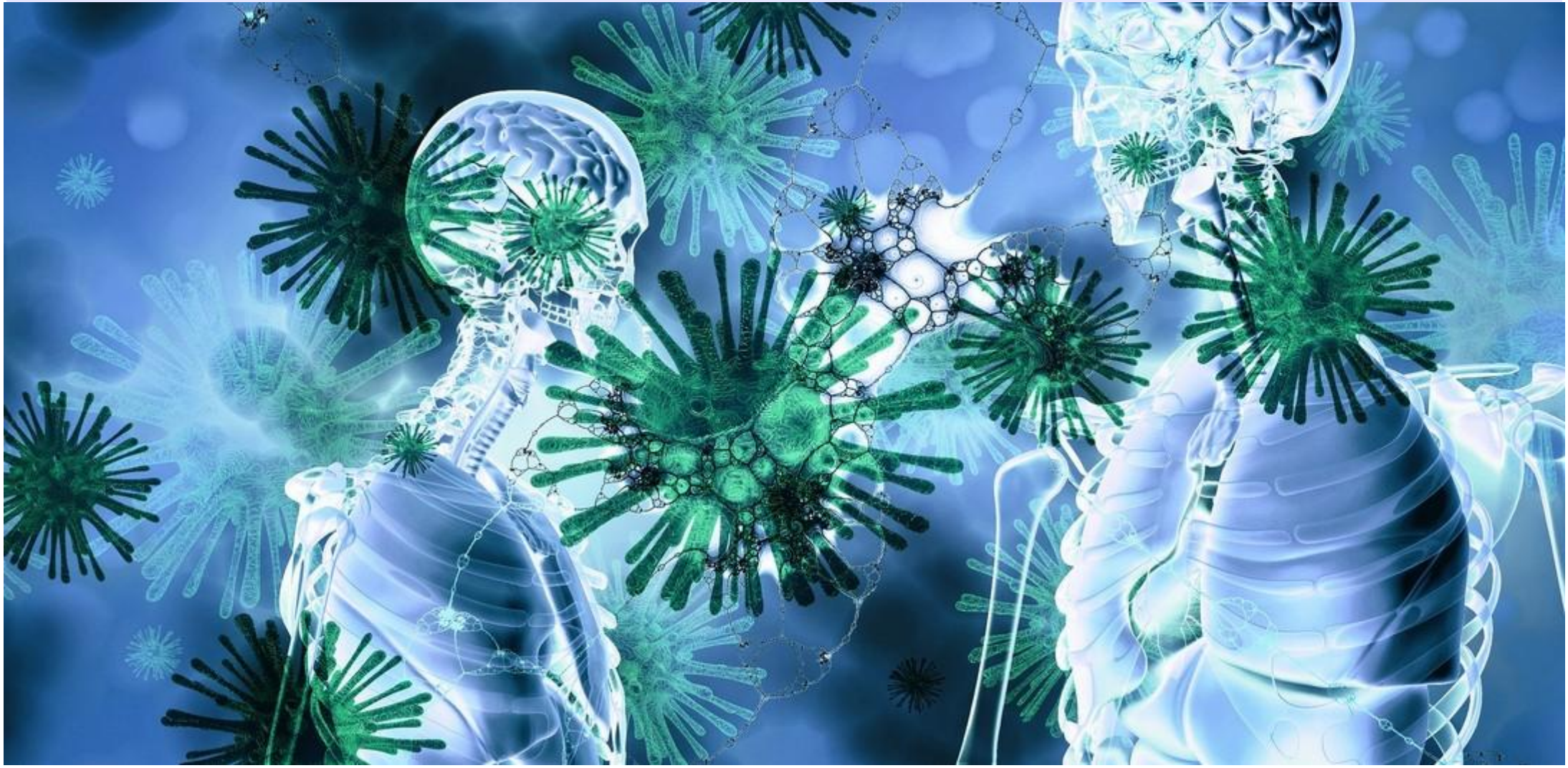
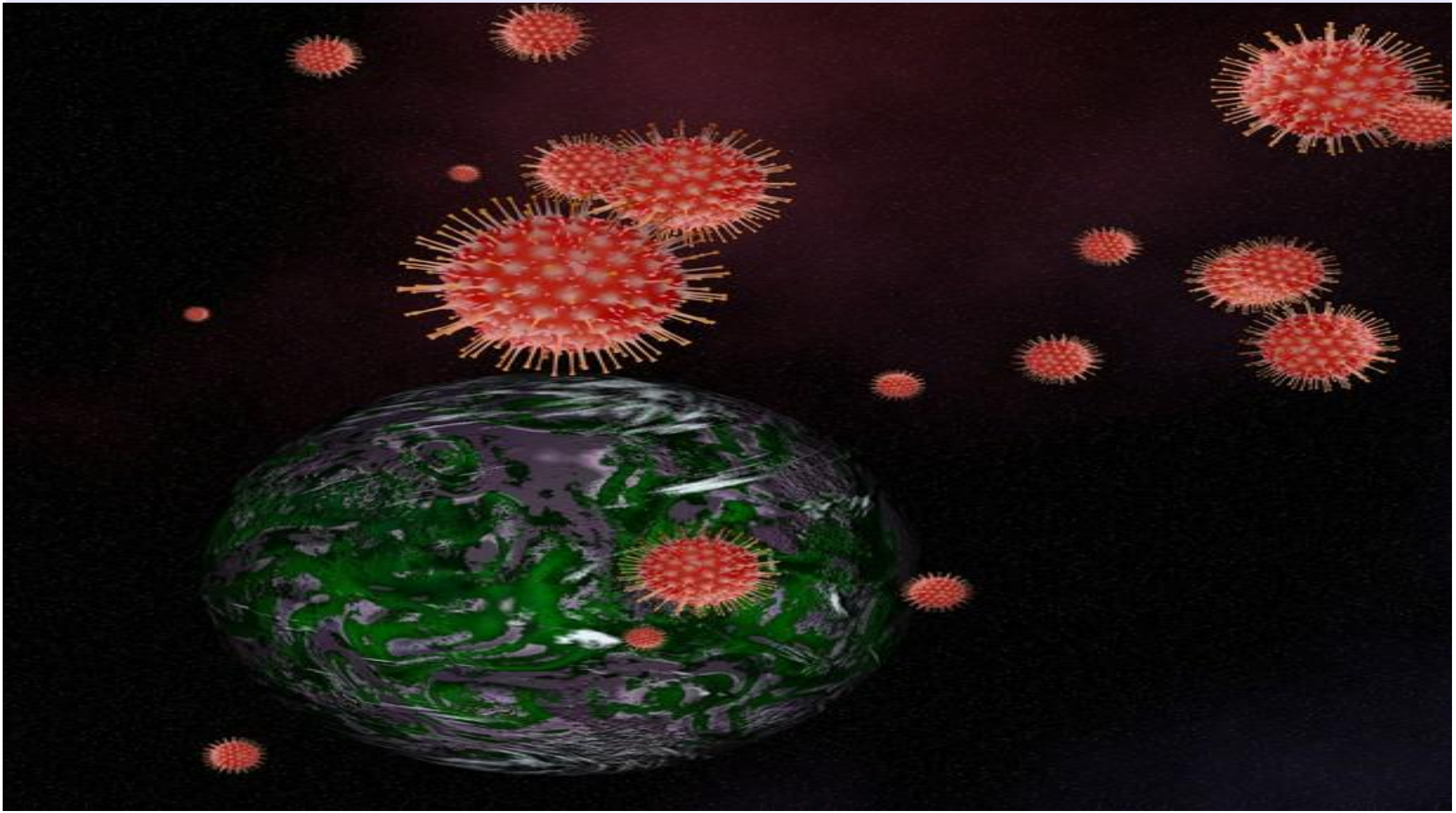
The Coronavirus Explained and What You Should Do

Transcript of the video:
https://www.youtube.com/watch?v=BtN-goy9VOY



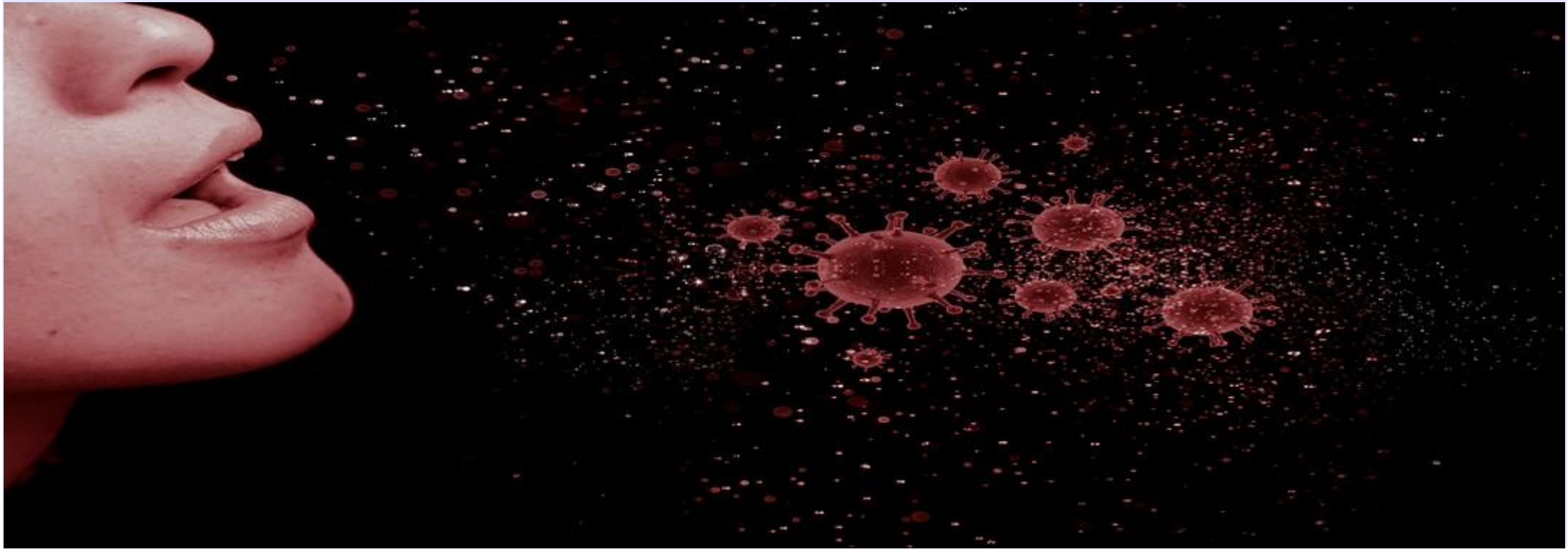
In December 2019 the Chinese authorities notified the world that a virus was spreading through their communities. In the following month, it spread to other countries with cases doubling within days.

This virus is the Severe Acute Respiratory Syndrome-Related Coronavirus 2, that causes the disease called Covid 19 and that everyone simply calls coronavirus.

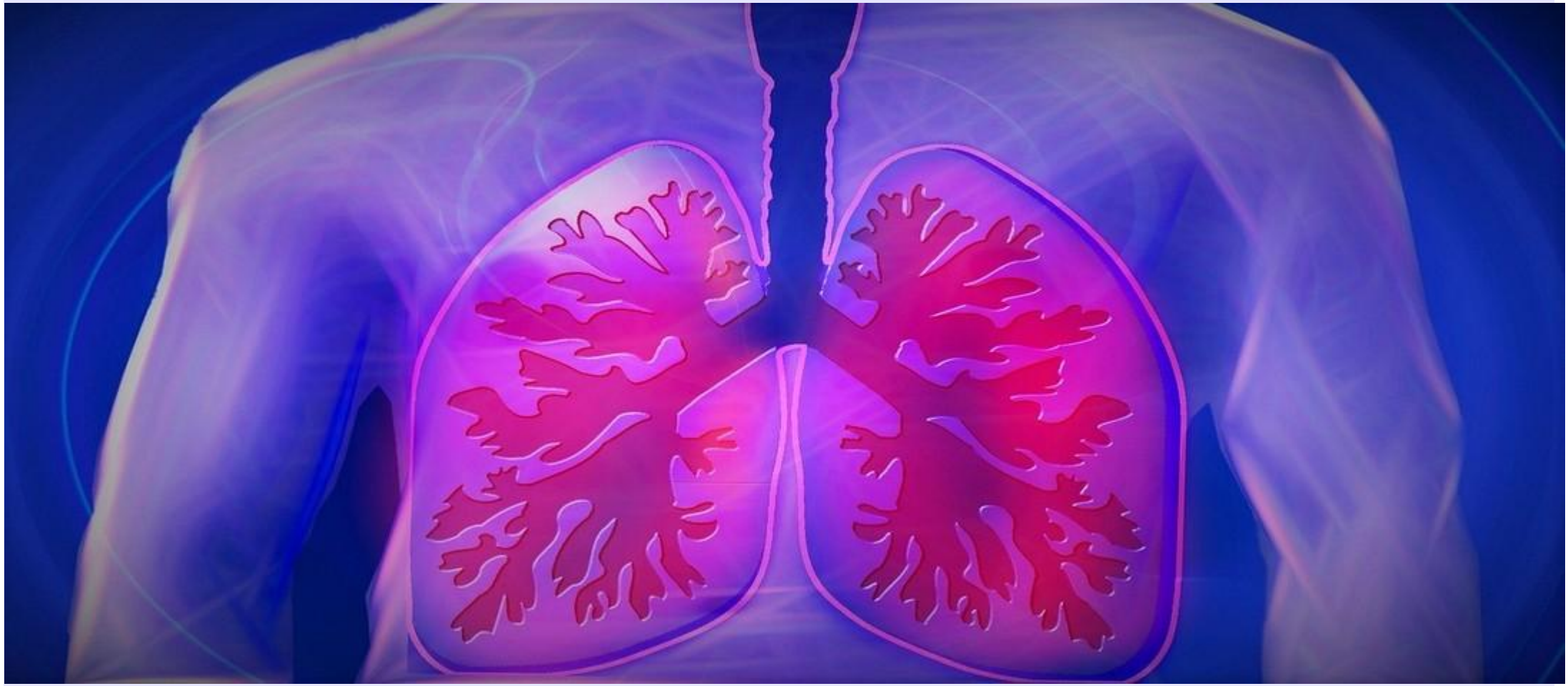


What actually happens when it infects a human and what should we all do?

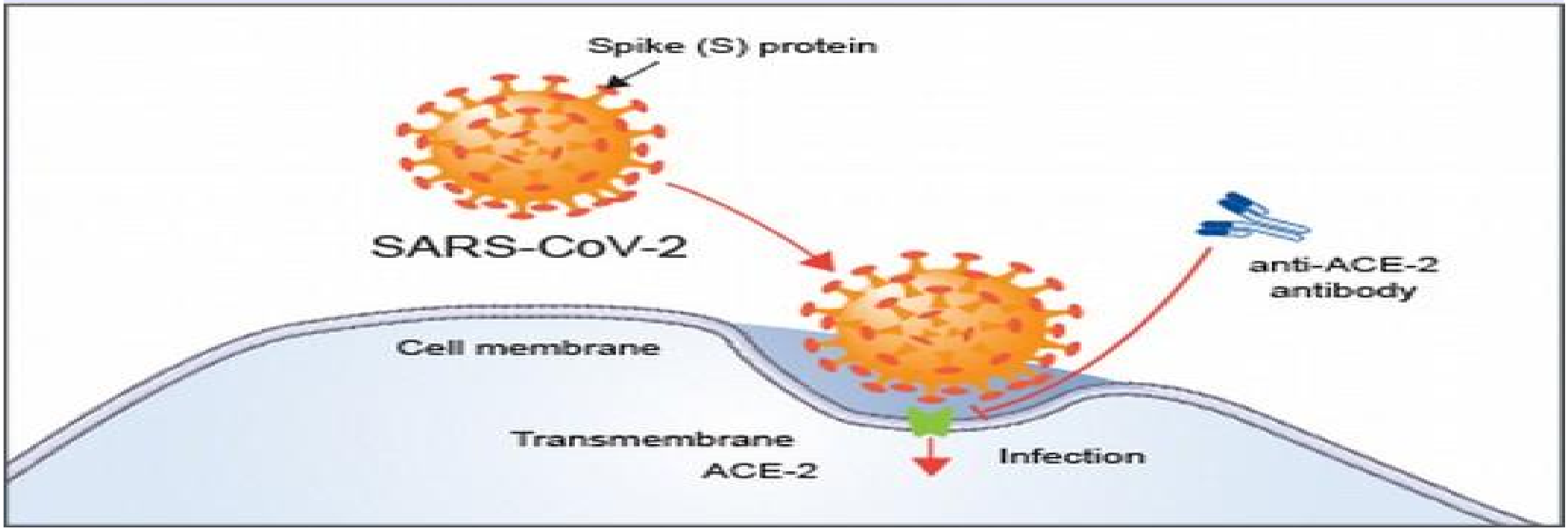
A virus is really just a hull around genetic material and a few proteins, arguably not even a living thing. It can only make more of itself by entering a living cell. Corona may spread via surfaces, but it's still uncertain how long it can survive on them. Its main way of spreading seems to be droplet infection when people cough, or if you touch someone who's ill and then your face, say rubbing your eyes or nose.



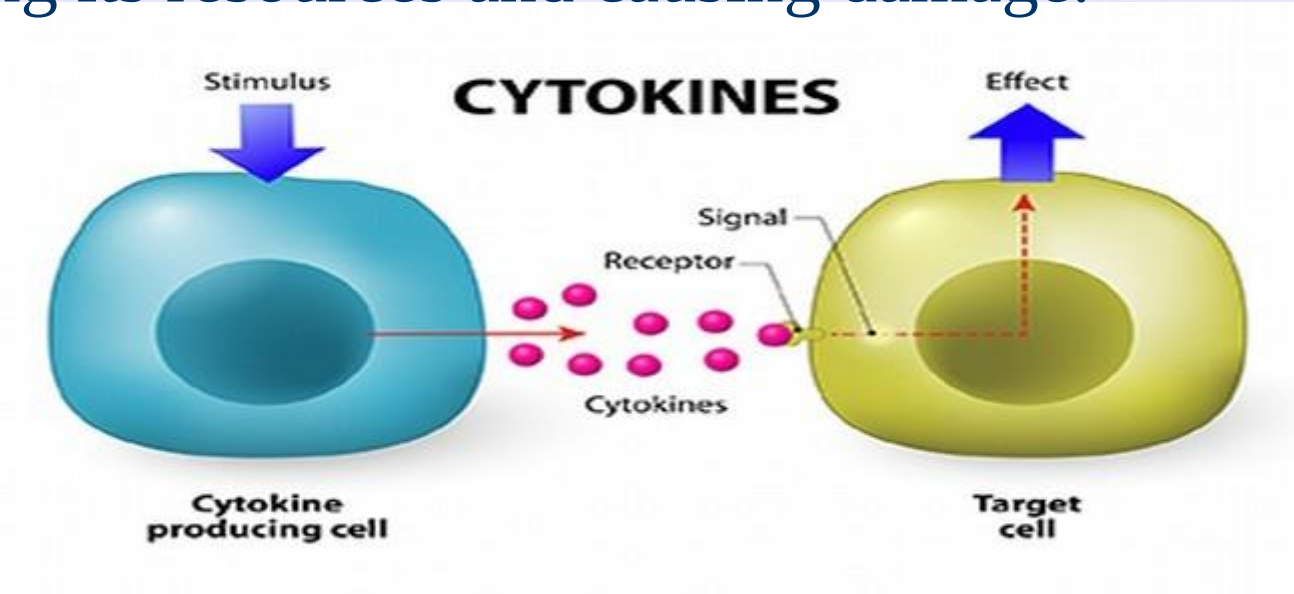
The virus starts its journey here, and then hitches a ride as a stowaway deeper into the body. Its destinations are the intestines, the spleen or the lungs, where it can have the most dramatic effect. Even just a few corona viruses can cause quite a dramatic situation. The lungs are lined with billions of epithelial cells. These are the border cells of your body, lining your organs and mucosa waiting to be infected.



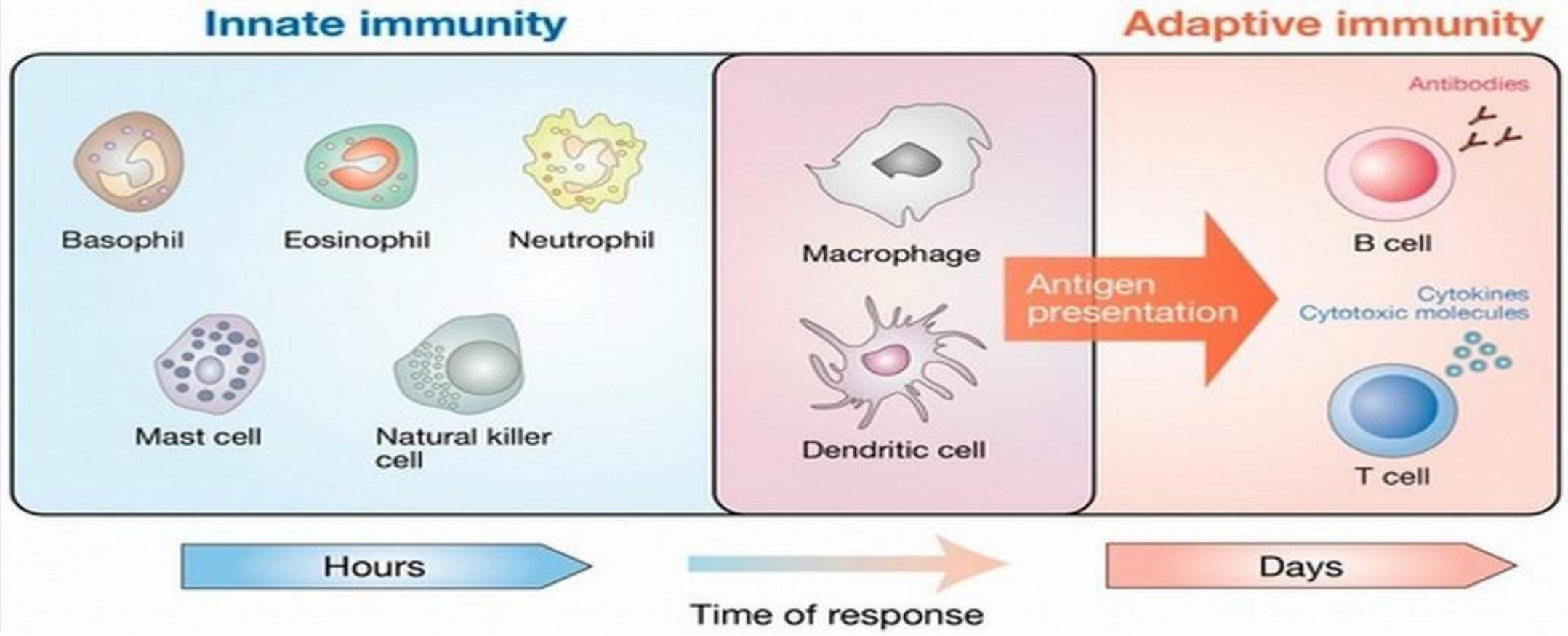
Corona connects to a specific receptor on its victim's membranes to inject its genetic material. The cell, ignorant of what's happening, executes the new instructions, which are pretty simple: copy and reassemble. It fills up with more and more copies of the original virus until it reaches a critical point and receives one final order, self destruct. The cell sort of melts away, releasing new corona particles ready to attack more cells. The number of infected cells grows exponentially. After about 10 days, millions of body cells are infected, and billions of viruses swarmed the lungs.



The virus has not caused to much damage yet, but corona is now going to release a real beast on you, your own immune system. The immune system, while there to protect you can actually be pretty dangerous to yourself and needs tight regulation. And as immune cells pour into the lungs to fight the virus, Corona infects some of them and creates confusion. Cells have neither ears nor eyes. They communicate mostly via tiny information proteins called cytokines. Nearly every important immune reaction is controlled by them. Corona causes infected immune cells to overreact and yell bloody murder. In a sense, it puts the immune system into a fighting frenzy and sends way more soldiers than it should, wasting its resources and causing damage.



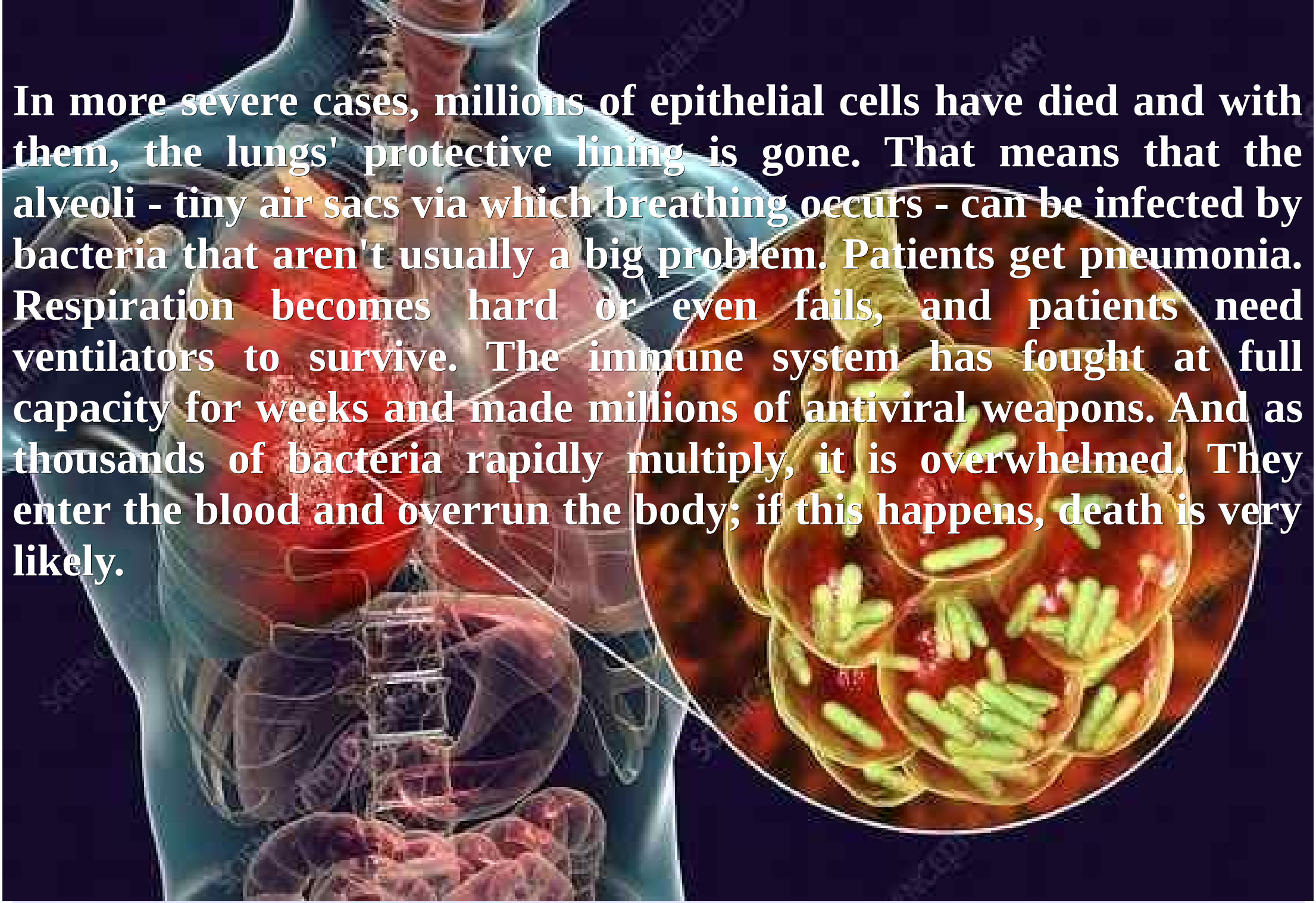
Two kinds of cells in particular wreak havoc. First, neutrophils, which are great at killing stuff, including our cells. As they arrive in their thousands, they start pumping out enzymes that destroy as many friends as enemies. The other important type of cells that go into a frenzy are killer T-cells, which actually order infected cells to commit controlled suicide. Confused as they are, they start ordering healthy cells to kill themselves too.



The more and more immune cells arrive, the more damage they do, and the more healthy lungs tissue they kill. This might get so bad that it can cause permanent irreversible damage, that leads to lifelong disabilities (Scar Tissue, Fibrosis).

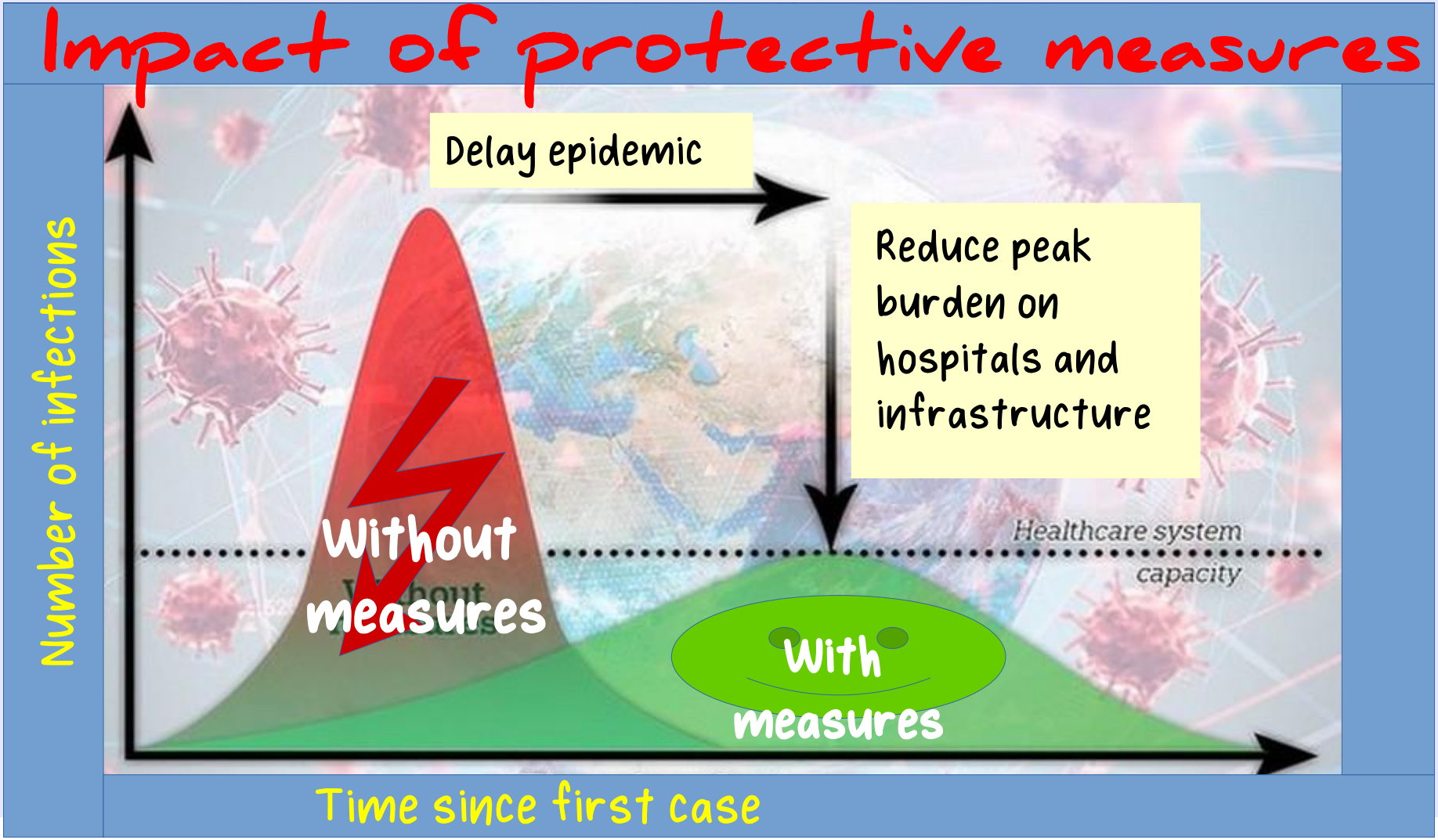
In most cases, the immune system slowly regains control. It kills the infected cells, intercepts the viruses trying to infect new ones and cleans up the battlefield. Recovery begins. The majority of people infected by Corona will get through it with relatively mild symptoms (Fever, Dry Cough).

But many cases become severe or even critical. We don't know the percentage because not all cases have been identified, but it's safe to say that there is a lot more then with the flu (Corona is particularly dangerous for people over 60 and patients with preexisting conditions or weakened immune systems).



In more severe cases, millions of epithelial cells have died and with them, the lungs' protective lining is gone. That means that the alveoli - tiny air sacs via which breathing occurs - can be infected by bacteria that aren't usually a big problem. Patients get pneumonia. Respiration becomes hard or even fails, and patients need ventilators to survive. The immune system has fought at full capacity for weeks and made millions of antiviral weapons. And as thousands of bacteria rapidly multiply, it is overwhelmed. They enter the blood and overrun the body; if this happens, death is very likely.

The Corona virus is often compared to the flu, but actually, it's much more dangerous. While the exact death rate is hard to pin down during an ongoing pandemic, we know for sure that it's much more contagious and spreads faster than the flu. There are two futures for a pandemic like Corona: fast and slow.



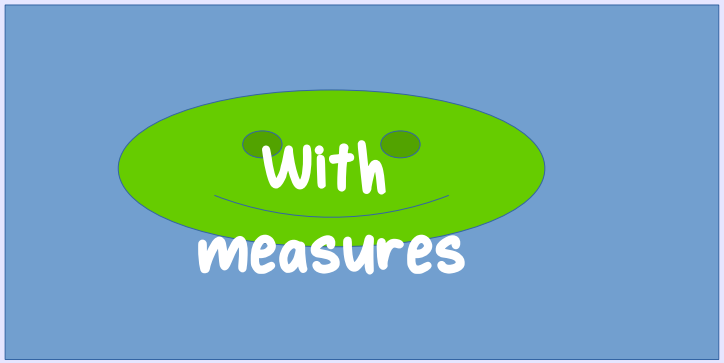
Which future we will see depends on how we all react to it in the early days of the outbreak. A fast pandemic will be horrible and cost many lives; a slow pandemic will not be remembered by the history books.

The worst case scenario for a fast pandemic begins with a very rapid rate of infections because there are no counter measures in place to slow it down.

Why is this so bad?

In a fast pandemic, many people get sick at the same time. If the numbers get too large, health care systems become unable to handle it.

There aren't enough resources, like medical staff or equipment like ventilators, left to help everybody. People will die untreated. And as more health care workers get sick themselves the capacity of health care systems fall even further. If this becomes the case, then horrible decisions will have to be made about who gets to live and who doesn't. The number of deaths rises significantly in such a scenario.

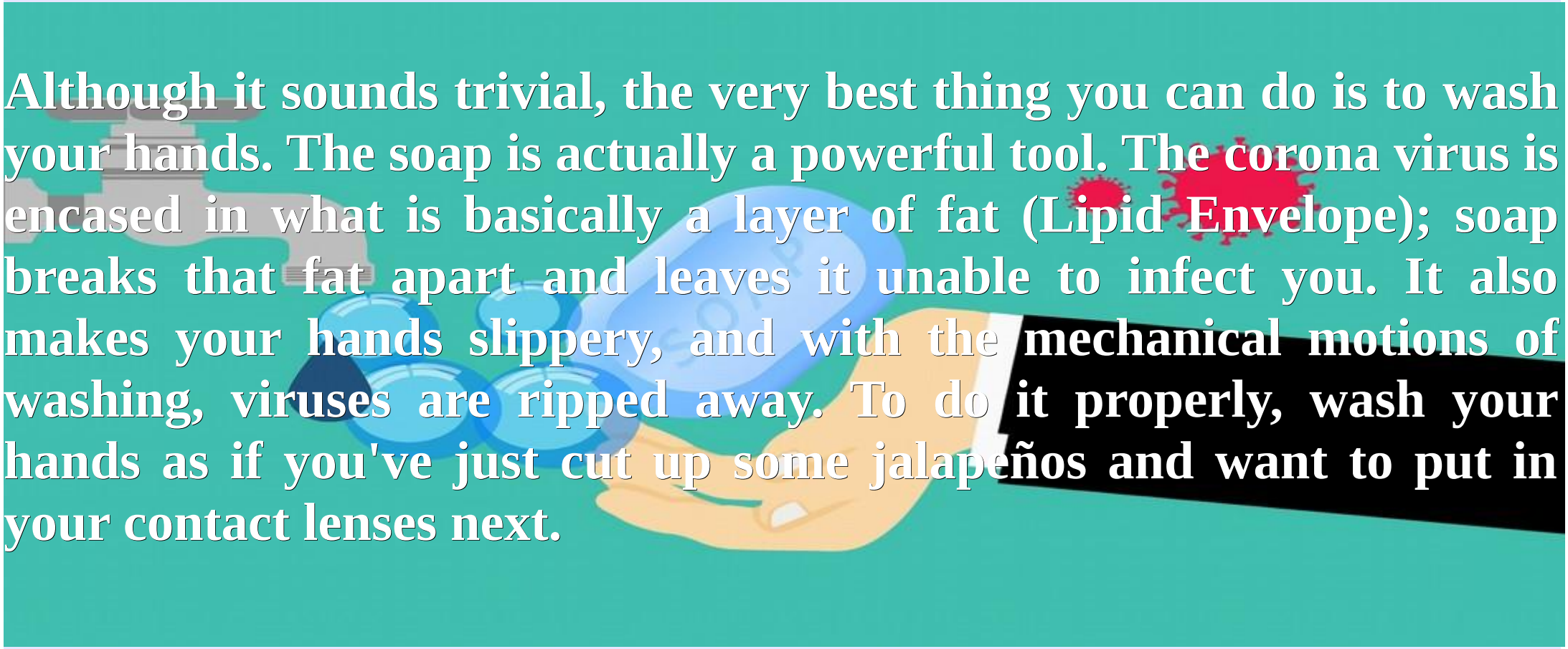


To avoid this, the world - that means all of us - needs to do what it can to turn this into a slow pandemic. A pandemic is slowed down by the right responses. Especially in the early phase, so that everyone who gets sick can get treatment and there's no crunch point with overwhelmed hospitals.

Since we don't have a vaccine for Corona, we have to socially engineer our behavior, to act like a social vaccine.

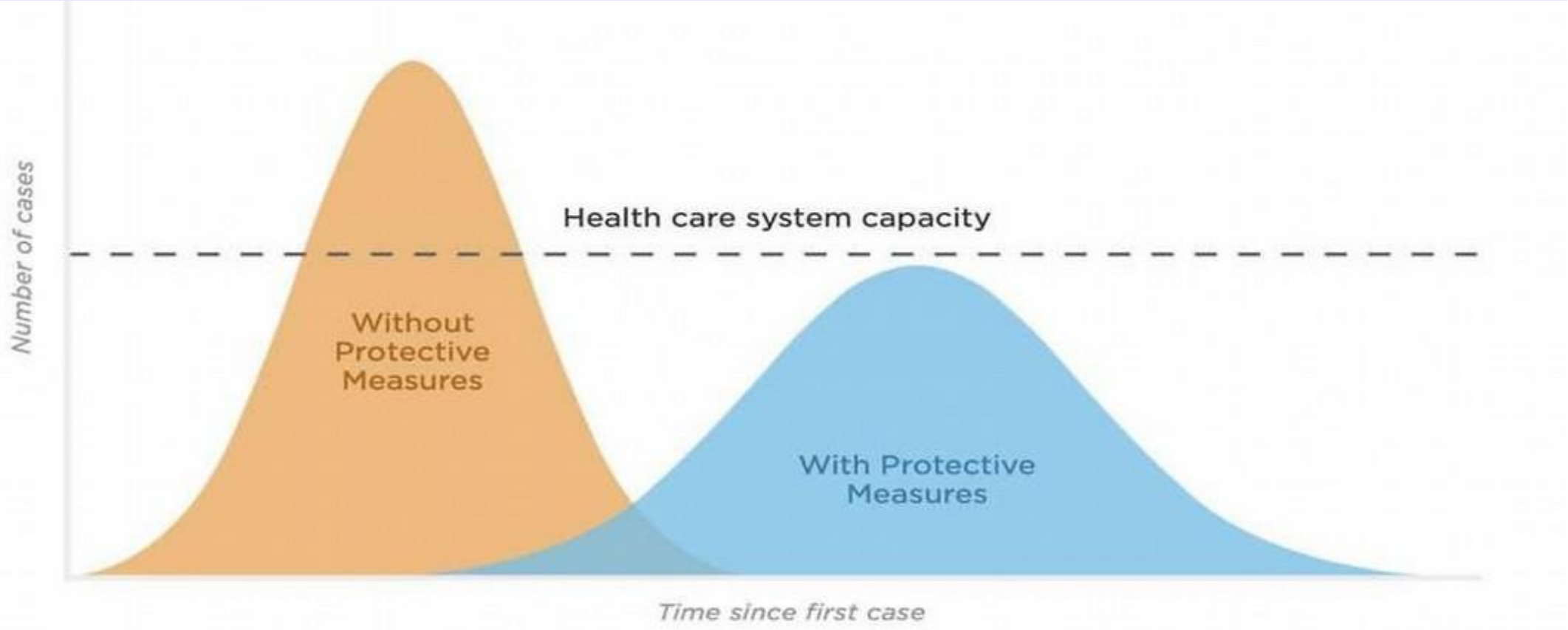
This simply means two things:

1. Not getting infected; and 2. Not infecting others.



The next thing is social distancing, which is not a nice experience, but a nice thing to do. This means: no hugging, no handshakes. If you can stay at home, stay at home to protect those who need to be out for society to function: from doctors to cashiers, or police officers. You depend on all of them; they all depend on you to not get sick. On a larger level, there are quarantines, which can mean different things, from travel restrictions or actual orders to stay at home. Quarantines are not great to experience and certainly not popular. But they buy us - and specially the researchers working on medication and vaccinations - crucial time. So if you are put under quarantine, you should understand why, and respect it. None of this is fun. But looking at the big picture, it is a really small price to pay.

The question of how pandemics end, depends on how they start; if they start fast with a steep slope, they end badly. If they start slow, with a not-so-steep slope, they end okay-ish. And, in this day and age, it really is in all of our hands. Literally, and figuratively.



A huge thanks to the experts who helped us on short notice with this video, especially Our World In Data the online publication for research and data on the world's largest problems and how to make progress solving them. Check out their site. It also includes a constantly updated page on the Corona pandemic.